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MASTER OF MILITARY STUDIES

**COMFORTABLE WITH CHAOS: OPERATIONAL DESIGN IN THE NAVAL
SPECIAL WARFARE PLANNING PROCESS**

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

LCDR Richard A. Zaszewski

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Executive Summary

Title: Comfortable with Chaos: Operational Design in the NSW Planning Process

Author: Lieutenant Commander Richard A. Zaszewski

Thesis: The Naval Special Warfare (NSW) mission planning process is an incomplete decision making paradigm that lacks the necessary conceptual components to provide solutions to interactively complex problems in an evolving “multi-nodal” world.

Discussion: The strategic environment is becoming more complex: the world power distribution is shifting as new coalitions form based on diplomatic, military, and economical self interest. Additionally, adversarial state and non-state actors will resort to irregular forms of warfare to challenge the primacy of U.S. Military power. These threats will attempt to gain legitimacy and influence over populations by exploiting the complicated interplay of cyber, energy, economics, technology and the globally connected domains. The interactive complexity of the strategic realm requires NSW leaders to attain a holistic understanding of the environment that their activities impact. Commiserate with this imperative, NSW leaders must collaboratively “understand, plan, act, assess and adapt” with U.S., multinational and host nation partners to devise a comprehensive operational approach that provides a whole of nation solution to interactively complex problems. To address the increasing complexity of the strategic environment, the U.S. Army and Marine Corps adopted operational design into their planning methodologies. Operational design is a conceptual planning paradigm based on Systems Theory that provides solutions to interactively complex problems within the broader context of the operating environment. It is important to understand that operational design does not replace detailed mission planning but planning is incomplete without design. The intent of this paper is not to compare and contrast operational design and the NSW Mission Planning Process but to elucidate the complementary nature of conceptual and detailed planning

Conclusion: Naval Special Warfare must incorporate operational design into its doctrine, processes and organization in order to ensure mission success, maximize effectiveness and maintain its overall relevancy in the strategic domain.

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Introduction

“To shape the future force, we must grow leaders who can truly out-think and out-innovate adversaries while gaining trust, understanding and cooperation from our partners in an ever-more complex and dynamic environment.”¹
- The National Military Strategy of the U.S. - 2011

The Naval Special Warfare (NSW) mission planning process is an incomplete decision making paradigm that lacks the necessary conceptual components to provide solutions to interactively complex problems in an evolving “multi-nodal” world.² The strategic environment is becoming more complex: the world power distribution is shifting as new coalitions form based on diplomatic, military, and economical self interest. Additionally, adversarial state and non-state actors will resort to irregular forms of warfare to challenge the primacy of U.S. Military power.³ These threats will attempt to gain legitimacy and influence over populations by exploiting the complicated interplay of cyber, energy, economics, technology and the globally connected domains.

The interactive complexity of the strategic realm requires NSW leaders to attain a holistic understanding of the environment that their activities impact. NSW leaders, in order to maximize the effectiveness of their units’ actions, must “understand the population and operating environment, including the complex historical, political, socio-cultural, religious, economic and other causes of violent conflict.”⁴ Commiserate with this imperative, NSW leaders must collaboratively “understand, plan, act, assess and adapt” with U.S., multinational and host nation partners to devise a comprehensive operational approach that provides a whole of nation solution to interactively complex problems.⁵

The current NSW mission planning process is an analytical problem solving methodology that is designed to provide solutions to *structurally complex* special operations problems.⁶ The process is ill equipped to generate conceptual approaches to the interactively

complex environment that contains multiple inter-dependant variables as delineated above. To address the increasing complexity of the strategic environment, the U.S. Army and Marine Corps adopted Operational design into their planning methodologies. Operational design is a conceptual planning paradigm based on Systems Theory that provides solutions to interactively complex problems within the broader context of the operating environment. It is important to understand that Operational design does not replace detailed mission planning but planning is incomplete without design.⁷ The intent of this paper is not to compare and contrast Operational design and the NSW Mission Planning Process but to elucidate the complementary nature of conceptual and detailed planning. (See Figure 1) As General Mattis stated in reference to this planning dichotomy, “the two processes always are complementary, overlapping, synergistic, and continuous.”⁸ Operational design enables planners to: anticipate friendly and enemy actions, derive holistic solutions to complex problems, identify enemy critical vulnerabilities and negotiate with inter-agency and coalition partners. To this end, Naval Special Warfare must incorporate Operational design into its doctrine, processes and organization in order to ensure mission success, maximize effectiveness and maintain its overall relevancy in the strategic domain.

Two Types of Systems

“As we have seen, the conduct of war branches out in almost all directions and has no definite limits; while any system, any model, has the finite nature of a synthesis.”⁹

– Clausewitz, On War

One must have a basic understanding of the nature of a system in order to solve a problem that arises within that system. Operationally defined, a system contains parts or subsystems that interact with each other and ultimately determine its nature.¹⁰ There are two types of systems that possess unique characteristics - structurally complex (linear) and

interactively (nonlinear) complex systems. Structurally complex systems produce “rigid, lockstep and generally predictable behavior.”¹¹ A structurally complex system becomes more complex as the number of parts increases and the more orderly the arrangement of those parts become in relation to each other. A simple example of a structural system is the automobile. The automobile operates in a predictable way and, practically speaking, a problem with the engine can be solved by reducing the engine down to its parts (provided that one is mechanically inclined). Analytic decision making tools, like the NSW mission planning process, are designed to solve structurally complex problems by applying a linear and procedural methodology to derive a solution. The mission (problem) is broken down to its parts by phases, components and variables and analyzed to ultimately determine a suitable course of action.

Interactively complex (nonlinear) systems are inherently unpredictable due to the freedom of action of its subcomponents.¹² The degree of complexity and dynamic behavior of an interactively complex system increases as the subsystems’ degrees of freedom increase. One cannot simplify the complexity by reducing the system to its parts because it is the level of interaction of the parts that determines the system’s nature. A “simple” example of an interactively complex system is a game of chess between two players. The free will of the players is the condition that makes the system interactively complex. The number of different games that can be played between these two players is 10^{120} – that is the approximate number of electrons in the universe.¹³ “We benefit little when we separate the parts of an interactively complex system and study them in isolation. In the act of separation the system loses its coherence and the parts lose their meaning.”¹⁴ Social problems like poverty, marginalization and energy dependence are examples of interactively complex problems. Simply stated, any problem that involves the will of people is an interactively complex problem.

Our difficulty in dealing with the insurgencies in Iraq and Afghanistan can be directly attributed to this phenomenon. These interactively complex problems are ill-structured; meaning that there are no obvious solutions. Analytical problem solving methods do not accommodate the interactive relationships of variables in an ill-structured problem like an insurgency. “Reductionism and analysis are not as useful with interactively complex systems because they lose sight of the dynamics between the components. The study of interactively complex systems must be systemic rather than reductionist, and qualitative rather than quantitative, and must use different heuristic approaches rather than analytical problem solving.”¹⁵ Therefore, analytical problem solving methodologies alone do not provide sustainable long term solutions to interactively complex problems.

The NSW Mission Planning Process

“Now the elements of the art of war are first, measurement of space; second, estimation of quantities; third, calculations; fourth, comparisons; and fifth, chances of victory. Quantities derive from measurement, figures from quantities, comparisons from figures, and victory from comparisons.”¹⁶ - Sun Tzu, “The Art of War”

The NSW mission planning process (NSW MPP) adheres to the Joint Operational Planning Process (JOPP).¹⁷ For this reason, this paper will treat the NSW MPP and JOPP interchangeably. This methodology is based upon a classical managerial decision making model: an analytical problem solving methodology that procedurally compares and contrasts potential solutions to problems (See Figure 2). A classical managerial decision making model generally involves seven steps: defining the problem, development of evaluation criteria, identification of alternative courses of action, evaluation of alternatives against criteria, selection of the best alternative, and execution.¹⁸ The process is strictly procedural and rational. The Navy Tactical Training Publication 3-05.2 (Navy SEAL Land Warfare) outlines the NSW MPP

in Chapter 2.¹⁹ It is important to note that the Navy publication refers the reader to the Army Operations Process manual (FM 5-0) for additional mission planning guidance but it does not specifically address operational design or solving ill-structured problems.²⁰

Analytical decision making models, like the NSW MPP and JOPP, have multiple advantages. Because of its simplicity, the analytical decision making process is effective in time constrained environments. The JOPP is based on the 96 hour planning cycle but the process can be abbreviated should a crisis arise. Analytical decision making models are utilized extensively in Iraq and Afghanistan to conduct time sensitive special operations. Additionally, the simplicity and non-abstract nature of an analytical decision making process enables its implementation by inexperienced members of the tactical elements. Lastly, the NSW MPP is useful in the synchronization of multiple maneuver elements in time and space to achieve a desired objective.

Analytical decision making processes attempt to influence events before they occur therefore, they must rely on multiple layers of assumptions regarding the operating environment.²¹ First, the analytical decision making process assumes that a problem is definable and the Commander's guidance and intent clearly articulates the end state.²² Second, the analytical models assume that it is possible to anticipate future events since all information required for a decision is readily available and all options can be evaluated to determine an optimal solution.²³ Third, it assumes the stability of the operating environment and the availability of time. Thus the chosen course of action will be the most direct solution to the problem.²⁴ Lastly, the analytical decision making process assumes full knowledge and participation of all key stakeholders involved in the decision making process. The NATO led, Helmand River Campaign in Afghanistan from 2005 to 2007 is an example where operational

design was not employed and the assumptions delineated above proved false when utilizing traditional analytical problem solving approaches to deal with an interactively complex situation.

The British 16th Air Assault Brigade launched Operation HERRICK IV to southern Helmand in 2006. Prior to this point, U.S. Special Forces conducted direct action raids to kill or capture senior Taliban and Al Qaeda leaders. The British forces deployed to the region under confusing orders and lacking a coherent purpose to their mission. Senior British politicians supported a counter-drug approach to stabilize a region that produced a significant portion of Afghanistan's opium export.²⁵ Meanwhile, British military personnel were planning on conducting counter-insurgency operations while under intense hostile fire.²⁶ The lack of a clear direction amongst British leaders stemmed from a lack of consensus on the root cause of the problem in Helmand. What resulted was a disharmonious and ill-synchronized approach to dealing with the insurgency in the region. The lack of clear direction was compounded by the lack of participation of the local political leadership. "There was essentially no 'Kabul-backed' regional government in the province when the British arrived; this created a number of obstacles, as Afghan governmental representatives were often not available to discuss operations or deal with reconstruction."²⁷ The absence of these key stakeholders in the planning process resulted in a dearth of information regarding potential solutions to Helmand's strife. To make matters worse for the 16th Air Assault Brigade, the operating environment shifted due to friendly and enemy influence. British Commanders initially desired to deploy company or platoon sized elements to secure population centers but in a deliberate way to prevent operational over-reach. British higher level decision makers, however, chose to increase the number of the tactical elements resulting in sustainability problems for the isolated garrisons. The Taliban quickly took advantage of the opportunity to strike at the over stretched British and launched an intense

campaign that further restricted the British ability to interact with the populace. Operation HERRICK IV was a tactical – military success for the British but their inability to conceptually grasp the interactive complexity of the insurgency in Helmand failed to provide a sustainable solution to the problem.

Characteristics of Operational design

“Commanders at all levels in ongoing and future armed conflicts will continue to face highly complex, dynamic and novel problem situations for which the known and practiced solutions may not suffice.”²⁸ – JWFC Doctrine Pamphlet

*“Design culture is inherently participative and pluralistic. It encourages continual reflection and discourse to develop inter-subjective (shared) meaning. The design culture is not seeking optimality against a set of measures of effectiveness, but rather improvement.”²⁹
– The Art of Design*

Operational design is a deliberative process that enables a commander and his staff to apply critical and creative thinking approaches to interactively complex problems.³⁰ The conversational methodology that design embodies creates a shared understanding about the problem and shared commitment to the broad operational approach.³¹ Operational design while complementary to detailed planning has multiple unique characteristics that set it apart from traditional analytical processes. First, Operational design is utilized to develop understanding about interactively complex problems for which there is no inherent logic. Decision makers typically solve problems intuitively or analytically; an interactively complex problem cannot immediately be solved using either one of these methods.³² Second, Operational design is a conceptual decision making paradigm that views the operating environment as an *open system* – a system that interacts within the broader confines of a larger system.³³ Operational design thus assumes an expansionist view of the operating environment. Third, Operational design focuses on problem framing vice problem solving. Problem framing involves understanding the root

cause of the problem to insure that the correct problem is addressed. Analytical decision making models focus on identifying a solution to a problem. Fourth, the design process, while requiring some level of structure, is focused on building an understanding of the environment vice building “products” for comparison. Finally, the tangible product of the design process is the *design concept*. The design concept is the commander’s visualization of a broad approach to addressing the problem.³⁴ The design concept inputs the detailed planning process for refinement and execution.

Operational Design Methodology

Operational design is a process that involves six formal steps: framing the environment, framing the problem, considering operational approaches, forging the design concept, execution and assessment and reframing. (See Figure 3) The process is iterative and procedural but the complexity of the problem may require the commander to regress to earlier steps or proceed to advanced steps until a broad solution emerges. Simply stated Operational design is non-linear in application and should not involve lock step rigidity in its execution. This characteristic must be adhered for creative and critical thinking to flourish amongst the members of the design team. Holistic self-learning about the nature of the system is more important than prematurely moving to a solution.

Framing the Environment

“The man responsible for evaluating the whole must bring to his task the quality of intuition that perceives the truth at every point. Otherwise a chaos of opinions and considerations would arise and fatally entangle judgment.”³⁵ – Clausewitz, On War

The Operational design process begins with receipt of a mission or planning guidance from higher authority. At this point, the commander and his staff gain an “initial impression of the mess” and begin erecting a framework of the complexity. If no solutions are immediately

evident and the problem is sufficiently complex, the commander forms a design team that includes key stakeholders in the problem. Design members should be selected for their capability to contribute as well as their involvement in the mission. If feasible, the tactical leadership responsible for detailed planning and execution should be incorporated. Examples of key stakeholders included on the design team are inter-agency personnel and field experts such as scientists or technicians. The commander must be mindful of the size of the design team as the most effective decision making groups have between five and six members. Design teams comprised of nine personnel are still effective but groups of 20 or more are completely ineffectual.³⁶ Members of the design team have assigned responsibilities. Minimum key roles are team leader, request for information (RFI) manager, time keeper, notes keeper and graphic annotator. Liaison teams are dispatched to connect with distant stakeholders not located with the commander. Episodic video teleconferences between the liaison and design teams are useful in conveying critical information from out stations. Of particular concern when forming the design team are operational security concerns and institutional boundaries that may preclude certain key stakeholders from membership. The commander should make every attempt through formal channels to include ostracized key stakeholders that are critical to framing the environment.

When framing the environment, the first question the design team attempts to answer is: what are the *current conditions* of the *observed system* and what is wrong with it? “An observed system is a term of reference for the current state of the system as we see it and understand it.”³⁷ The answer to the first question gives a contextual understanding of the system and why it should be influenced. The design team seeks the nature of the observed system and its conditions by analyzing its actors, tendencies, potentials and basic relationships.

- Actors are those individuals or communities that comprise the system and attempt to advance their individual or collective interest.³⁸ There are *relevant* and *key actors*. *Relevant actors* are manifold; they can be government, non-government, criminal, military, insurgent or business etc. *Key actors* are fundamental to the behavior of the system and influence it more profoundly than relevant actors.³⁹ The design team must identify what key actors will support and those that will resist change to the desired system.
- “*Tendencies* are predictions about how the system will behave if left alone.”⁴⁰ For example, the Japanese would have continued their Imperial expansion in the Pacific if the United States did not respond to their aggression in World War Two.
- “*Potentials* are the limits to which a system can be influenced by our actions and those of others.”⁴¹ For example, Afghanistan does not have the potential to become an industrial power by 2014 when the U.S. departs the region.
- “*Relationships* are the linkages that connect the interaction of the actors that make up the system.”⁴² The relationships can be reinforcing (positive) or balancing (negative). For example, civilian casualties due to coalition air strikes in Afghanistan reinforce the legitimacy of Taliban. Conversely, the “Awakening” uprising in Iraq balanced Al Qaeda influence in the region.

A causal loop diagram is one type of schematic that depicts the relationships of the actors within a system. It is a useful tool that enhances the design team’s visualization of the operational environment. (See Figure 4) “Building explicit conceptual models of the situation help promote understanding among stakeholders of the various forces at work.”⁴³ Causal loop diagrams are one of many graphical depictions used to interpret the environment; others include

network, mind mapping and business models among others. (See Figure 5) The design team utilizes the model type that best fits their understanding of the operating environment. Despite the usefulness of these models, they also present several inherent challenges. First, if taken in isolation, models can be misinterpreted as an over-simplification of a complex problem. Second, as detail is added to the model, they can become confusing. Thus, a textual narrative must accompany the diagram to elucidate idiosyncrasies and details of the relationships. Presented in tandem, the narrative and graphic modeling of the operating environment enhances the commander's ability to generate a comprehensive interpretation of a complex dilemma. The initial "environmental frame" is derived from the graphic and textual representation of the observed system.

When framing the environment, the second question the design team asks is: what are the *feasible* and *better* conditions of the *desired system*? "The *desired system* consists of those conditions that, if achieved, meet the objectives of policy, orders, guidance, and directives issued to the commander."⁴⁴ The answer to the second question builds a better appreciation for the purpose and the approximate scope of the action to be taken. The usage of *feasible* and *better* to describe the conditions of the desired system is significant because it underscores that available time and resources are critical to the determination of a suitable approach. These terms imply that the chosen operational approach "satisfices" the problem and may not be the optimal solution.⁴⁵ The environmental frame is developed and refined to depict how the system could "trend" from the observable (current) conditions to the desired (future) conditions. The environmental frame results in the generation of a tangible end state of the desired system and an articulation of its desired conditions.

Framing the Problem

*"[W]hen we propose a solution to a problem, we ought to try as hard as we can to overthrow our solution rather than defend it... Yet criticism will be fruitful only if we state our problem as clearly as we can and put our solution in a sufficiently definite form – a form in which it can be critically discussed."*⁴⁶ – K. Popper, "The Logic of Scientific Discovery"

In problem framing, the commander and his design team transition from developing a deep understanding of the operating environment to determining the correct problem and its underlying causes. "Problem framing involves understanding and isolating the root causes of conflict – defining the essence of a complex, ill-structured problem."⁴⁷ The design team transforms the graphic and textual environmental frame into the problem frame by conducting an in depth analysis of the system's actors and its tendencies and potential. The problem frame exceeds a superficial understanding of the relationships within the system. The design team, during problem framing, analyses multiple factors: the leadership, tension and competition, roles, agendas and alliances and patterns of behavior (L-TRAP) amongst the actors in the system.

- Leadership: Who are the friendly, enemy and neutral leaders in the system – both formal and informal? What leaders support and deter movement of the observed system to the desired system? Who are the most capable leaders? What are their patterns of life?
- Tensions and Competition: "Tension is the resistance or friction among and between actors."⁴⁸ Competition, for the purpose of this paper, is a form of tension between otherwise amiable individuals or groups. Nevertheless, competition is a source of friction that may impede the system's movement to more desirable conditions. "By analyzing these tensions, the commander identifies the problem that the design will ultimately solve."⁴⁹ Tension and competition is identified through pattern analysis of the actors.

- Roles: What functional roles do key actors play within the system? What utility do the key actors bring to the health and sickness of the system? What are the indirect results if a key actor is removed? Who will assume these roles?
- Agendas and Alliances: What are the key actors' underlying motivations? What are the overt and covert alliances amongst actors? How can the force leverage their agendas to gain genuine buy in and collaboratively move to the desired system?
- Patterns of Behavior: What are the individual patterns of behavior of key actors? Where and when are they most vulnerable – most capable?

The L-TRAP analysis method enables the design team to anticipate friendly and enemy actions, develop holistic approaches to the problem, identify enemy critical vulnerabilities and increase negotiating leverage with inter-agency and coalition partners. It is important that the commander and his design team continue to challenge their hypotheses regarding the relationships of key actors and the potential and tendencies of the system. The problem frame results in a statement that temporally and spatially describes the requirements for transformation. Additionally, the problem statement identifies when and where to anticipate changes and transitions in the operational environment.⁵⁰

Considering Operational Approaches

*"In a system, the chains of consequences extend over time and many areas: The effects of action are always multiple...the point reminds us that disturbing a system will produce several changes."*⁵¹ - R. Jervis, "Systems Effects: Complexity in Political and Social Life"

*"In this multi-nodal world, the military's contribution to American leadership must be about more than power – it must be about our approach to exercising power."*⁵²
- The National Military Strategy of the U.S. - 2011

The operational approach is the commander's visualization of those broad actions that will transform a system with observed conditions into a system with desired conditions.⁵³ The commander and the design team consider combinations of military, inter-agency, host nation and diplomatic approaches that may result in the desired conditions. Furthermore, the design team assesses the direct and indirect impact the operational approach will have on the system. As the operational approach is being refined, relevant subject matter expertise is enlisted to support the design team. In developing the operational approach, the design team links tasks and purposes with the desired system and articulates the operational approach by using lines of operation, lines of effort or other elements of design.⁵⁴ Most importantly, the design team assesses how the effectiveness of the operational approach should be measured. What factors and conditions indicate that the system is trending toward desired conditions? Measuring effectiveness and performance of the operational approach is discussed later in this text.

The commander and his staff consider funding, asset availability and authorities to develop an operational approach that is feasible. An operational approach may require a force to have niche capabilities that necessitate specialized training or equipment. The commander must determine if additional funding is required to provide this capability. Additionally, the commander must be aware if an operational approach requires the deployment or extraction of the force with additional or unique assets. Lastly, the commander must have the authority to employ an operational approach and coordinate with adjacent elements supporting the operation. If there are discrepancies in funding, assets or authorities, the commander has the option to adjust the operational approach or request additional support from higher.

Analyzing the system with the L-TRAP paradigm enables the design team to anticipate friendly, enemy and neutral reaction to the operational approach; thus depicting the methodology

for maintaining initiative. The design team analyzes risk throughout the design process and attempts to mitigate risk during the design phase by leveraging inter-agency and host nation partners. “Collaboration, coordination, and cooperation among multinational military and civilian partners are essential to identifying potential options for mitigating risk, conserving resources, and achieving unity of effort.”⁵⁵ If necessary, the approach is re-adjusted to exploit enemy vulnerabilities while avoiding enemy strengths.

Forging the Design Concept

“No one starts a war – or rather, no one in his senses ought to do so – without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it.”⁵⁶
- Clausewitz, “On War”

The design concept is the link between the abstract nature of Operational design and the reality of the detailed planning process. In essence, the design concept is the commander’s articulated vision for moving the observed system to the desired system. The commander’s actual guidance is mission dependant and can vary significantly. Commonly, the design concept includes the following: the problem statement, a mission narrative, initial commander’s intent, planning guidance to include assumptions and operational limitations and any products from the design process (textual and graphic). “The design concept describes the desired conditions and the combinations of potential broad actions in time, space, and purpose to achieve the desired system.”⁵⁷ The design concept is injected into the detailed planning process and the course of action is extrapolated. Concurrently during the detailed planning process, the design team continues to refine the design concept within the context of the operating environment. The design concept is analyzed and assessed throughout the planning and execution phases. If at any time the operating environment invalidates the design concept, the commander and his staff must reframe their hypothesis of the operational approach.

Reframing

“And as water shapes its flow in accordance with the ground, so an army manages its victory in accordance with the situation of the enemy. And as water has no constant form, there are in war no constant conditions.”⁵⁸—Sun Tzu, “The Art of War”

The changing nature of warfare requires that commanders adapt their plans and methodologies to the operational environment. Reframing is the method within the design process that provides flexibility and versatility in an operational approach. The commander and his staff make the decision to reframe the problem and resolution when the original understanding of the environment or problem changes. “At any time during the operations process, the decision to reframe can stem from significant changes to understanding, the conditions of the operational environment, or the end state.”⁵⁹ Reframing is akin to what the renowned psychologist and philosopher Thomas Kuhn deemed a “paradigm shift.” A paradigm is the framework that scientists use to solve a set of difficult problems.⁶⁰ A “shift” is required when the current paradigm or understanding is no longer relevant. The commander and his staff must continually assess and evaluate their understanding of the existing problem and the operational approach they are employing to address that problem.⁶¹

In the “Art of Design,” the U.S. Army states that reframing is triggered in three ways: “a major event causes a —catastrophic change in the operational environment, a scheduled periodic review shows a problem, or an assessment and reflection challenges understanding of the existing problem and the relevance of the operational approach.”⁶² Reframing changes the understanding of the problem, requires the commander to revisit problem framing and involves the refinement of one or more key aspects of the design concept. For instance, reframing resulted in several shifts from enemy centric approaches to population centric approaches since the commencement of Operation ENDURING FREEDOM. The adjustment in the Afghanistan

operational approach permeated all aspects of the design concept and resulted in tactical directives to subordinate units that reflected the commander's new vision to achieve the desired end state.

Measuring Transformation

*"The number of parts making up the interactively complex system is not the critical issue, and we can't understand these systems by studying their parts in isolation. The very essence of the system lies in the interaction between parts and the overall behavior that emerges from the totality of these interactions."*⁶³ - JWFC Doctrine Pamphlet, "Design in Military Operations"

Measuring the transformation of the observed system to the desired system is critical to anticipating changes in the operational environment, identifying reframing triggers and signifying when desired conditions are met. "Commanders continuously assess the operational environment and the progress of operations, and compare them to their initial vision and commander's intent."⁶⁴ Leveraging all sources of intelligence, commanders challenge their hypotheses and adjust their operational approach to ensure the desired end state is achieved. The measurement of effectiveness and performance of a particular operational approach is frequently mishandled.⁶⁵ A common mistake is to measure for desired conditions while not analyzing those factors that indicate a trend toward the desired system. Until recently, Joint Inter-agency Task Force – South (JIATF-S) measured the performance of their counter-drug strategy by the quantity of cocaine and money seized during its operations.⁶⁶ These metrics misled planners into believing the efficacy of their strategy, overemphasized a simplified approach to a complex problem and did not alert the task force to the increase in complexity of the operating environment. SAMS design planners working with JIATF-S developed new measures of effectiveness and performance that provided relevant data based on the movement of the entire system to a desired state. The operating environment must be analyzed holistically, examining as many system attributes as possible to determine how relevant actors interact and conditions

change. From this perspective, quantifying the number of enemy significant activity (SIGACT) events does not accurately measure the performance of a counter-insurgency strategy when the underlying problem is host nation government legitimacy in the eyes of the populace. In this situation, other factors must be analyzed that are relevant to transitioning to the desired system. For example, greater voter turnout may be a more suitable metric for measuring the transformation of the system to better conditions.

Colombia – Operational design at Work

In 2002, when President Alvaro Uribe Velez took office, Colombia was enduring a multifaceted and interactively complex strategic situation. Three major insurgent groups battled with Colombian forces for legitimacy. First, the *Fuerzas Armadas Revolucionarias de Colombia* or FARC (Revolutionary Armed Forces of Colombia) controlled a vast region in Colombia – the *Zona de Despeje*.⁶⁷ From this safe haven, the FARC organized attacks on government forces and coordinated illicit narcotics operations. The safe haven also afforded the FARC with a training and organizational base. Additionally, the FARC received funding, training and equipping support from international state and non-state entities endeared to their cause.⁶⁸ Second, the *Ejercito de Liberacion Nacional* or ELN (National Liberation Army) conducted subversive attacks on Colombian institutions and organizations to further their Marxist cause. While not as prolific or grand as the FARC, the ELN represented an additional security problem to the Colombian government that required alternative approaches. Lastly, the *Autodefensas Unidas de Colombia* or AUC (Self-defense Forces of Colombia) was a home grown paramilitary movement that formed due to the inefficacy of Colombian government security operations to combat the FARC and ELN. The AUC carried out vigilante and terror attacks on FARC – ELN operators and supporters. Despite fighting for the survival of Colombia's democratic institution, the AUC

increasingly resorted to the drug trade to fund their operations and ultimately challenged the legitimacy of government forces and institutions. Against this back drop, President Uribe took office and designed a comprehensive strategy to tackle the “wicked” problem.

President Uribe designed an operational approach that significantly contrasted with the strategy of his predecessor, President Andreas Pastrana. President Pastrana focused on negotiating a settlement with the FARC and ELN, perceiving that the underlying cause of Colombia’s strife was the narcotics trade.⁶⁹ Attempting to placate the FARC, President Pastrana imparted the *Zona de Despeje* to the insurgent group - a region as big as the country of Switzerland. Pastrana’s strategy, *Plan Colombia*, was nothing more than a list of social ills with proposed solutions; however, President Uribe’s *Democratic Security and Defense Policy* was an operational approach designed to provide Colombia with a course of action to solve the interactively complex problem.⁷⁰

First, Uribe’s policy framed the environment – it recognized the interactive complexity of “terrorism; the illegal drugs trade; illicit finance; traffic of arms, ammunition, and explosives; kidnapping and extortion; and homicide.”⁷¹ Second, Uribe’s administration framed the problem as a lack of personal security for all Colombians that stemmed from “the state’s absence from large swaths of the national territory.”⁷² Third, the Colombian government designed an operational approach to ensure national integration and sovereignty.⁷³ Ultimately, Uribe’s design concept was to consolidate control of national territory. Security forces would physically reestablish control of contested areas then other government institutions would embark on social and fiscal initiatives to consolidate these gains.⁷⁴ The shared understanding of the problem frame resulted in unity of effort amongst the various departments of the Colombian government – unattainable by previous presidents. From 2002 to 2006, the Uribe administration reframed

their understanding of the problem and challenged their hypotheses as the operating environment changed. In conclusion, President Uribe designed an elastic strategy that improved the Colombian system that still endures today.

Limitations of Operational design

"A good solution applied with vigor now is better than a perfect solution ten minutes later..."⁷⁵

- Gen. George S. Patton, Jr.

Time consumption is the greatest limitation of the operational design process; therefore, it has limited application when conducting special operations in time sensitive environments. Certain crisis situations, such as rescuing a prisoner of war (POW), require that NSW forces alert, deploy and execute in a very short period of time due to the nature of perishable intelligence, enemy action and external political factors. In these instances, a profound understanding of the operating environment is a lesser priority to the successful outcome of the mission. Eliminating operational design from the decision making process during time sensitive missions results in a quicker turnaround for execution but the absence of design results in a superficial understanding of the underlying causes of the problem. "Planning without design may not result in as deep an understanding as that resulting from the design process."⁷⁶ Conducting operational design in parallel with detailed planning and execution is an alternative option to completely removing design from the decision making process. "A unit may already be planning and executing when the commander recognizes a need for design."⁷⁷ This is the most difficult situation for implementing operational design due to the number of moving parts and the amount of "catch up" required of the design team. In this situation, the commander must choose the members of his design team based on the members' knowledge of the current situation and their "track record" of designing together.⁷⁸ The commander, to prepare for such scenarios,

should have a standing design team prepared to integrate into crisis action planning. If there is no standing design team, the commander must balance regional expertise and knowledge of the design process when choosing team members.

Implications

The capability of NSW leaders to seamlessly integrate and plan with partners to derive approaches to complex situations is the greatest implication for incorporating operational design into the NSW planning process. Several steps must be taken to accomplish this objective. First, system theory and operational design must be infused into NSW education and training. System theory underpins design with concepts and terminology. This paper superficially addresses some key aspects of system theory but NSW leaders must attain a deeper understanding of systems in order to become capable practitioners of design. Additionally, operational design must be introduced to NSW leaders at all echelons. Training should focus on teaching design through planning exercises. Utilizing simulations and hypothetical scenarios, NSW leaders will learn how to model systems and devise operational approaches to complex problems. U.S. Army SAMS students learn operational design during three – two week long practical exercises that encourage experimentation and reflection on the practice of design. NSW should utilize a similar methodology, starting in SEAL Qualification Training (SQT) that progressively teaches its leaders how to practice design.

Second, NSW should deploy O-5 commanders who are adept at operational design to countries where NSW tactical elements are conducting theatre support activities. These commanders, stationed at the U.S. embassy, should embed with country team planners to assist them with devising operational approaches to regional problems. Deploying NSW operational designers to country teams will have immediate impacts on operations and strategy. The

commanders will assist the country team planners in formulating whole of nation approaches that incorporate NSW participation. Additionally, these planners will gain a deeper appreciation of the complexity of the situation thus enabling them to better direct the tactical and operational employment of NSW elements.

Conclusion

Naval Special Warfare's inherent flexibility and its cultural aversion to doctrine create ripe conditions for the inclusion of operational design into the NSW mission planning process. As the employment pendulum swings from sustained combat operations to theatre engagement, NSW leaders must be capable of integrating and planning with a myriad of partners to devise lasting solutions to complex problems. The future security of our homeland will not be measured by how many enemy are killed, nor by how many mouths are fed, but in essence how the United States is able to blend these two seemingly disparate lines of effort into one consolidated strategy. Our struggle to develop a lasting operational approach in Afghanistan that fuses all elements of national power is a harbinger of things to come as we pursue our enemies to other safe havens around the world. The exact solution to this problem will vary with the region that harbors the terrorist network but it will certainly require a broader and more comprehensive view of war-fighting. Our future strategy for counter-terrorist operations must account for the interactive complexity of a host nation's infrastructure and economy as well as the enemy's capabilities. Operational design, if incorporated into the NSW mission planning process, will enable NSW leaders to develop a more complete understanding of the local, regional and national geo-political terrain to de-code this complex enigma. Additionally, the future pursuit of our nation's enemies abroad will require a more collaborative approach with our inter-agency and coalition partners. We must fully grasp their institutional concerns and incorporate these

variables into the overall analysis. Habitual working relationships with embassy staff, built years in advance, will be the deciding factors in Special Operation's freedom of maneuver on future battle fields. Special Operations Forces can no longer view its part in this fight as a single compound assault executed in a vacuum.

Figure 1: The Military Decision Making Continuum – Operational design is the “left side” of detailed mission planning

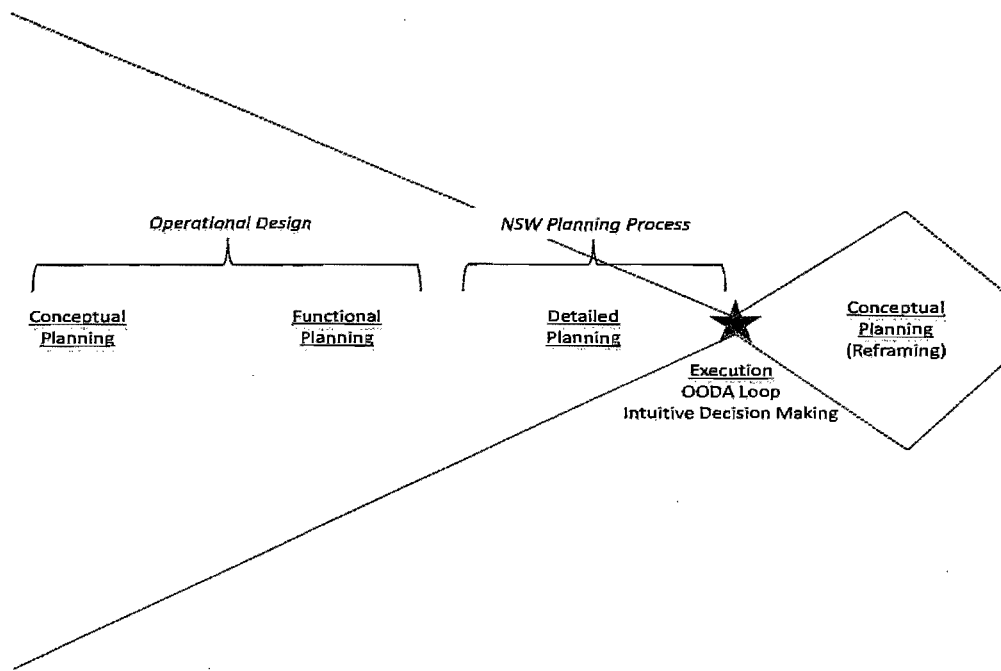


Figure 2: The Joint Operation Planning Process. Taken from NSW Tactics and Training Publication 3-5.2 "SEAL Land Warfare"

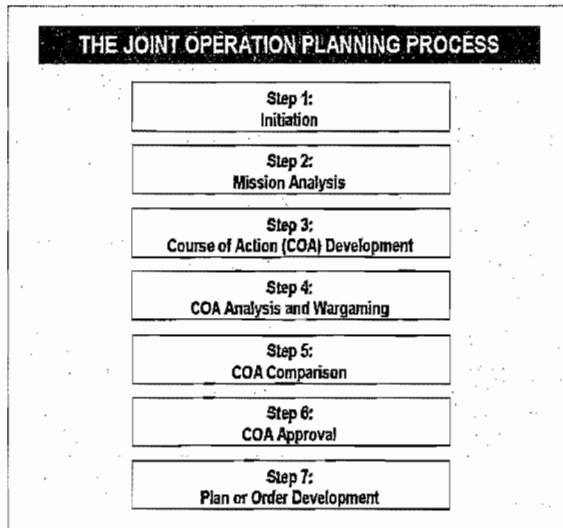


Figure 2-1. The Joint Operation Planning Process (from Joint Pub 5-0, Fig III-3, p. III-20)

Figure 3: Operational Design Methodology (utilizing U.S. Army and U.S.M.C. design components)

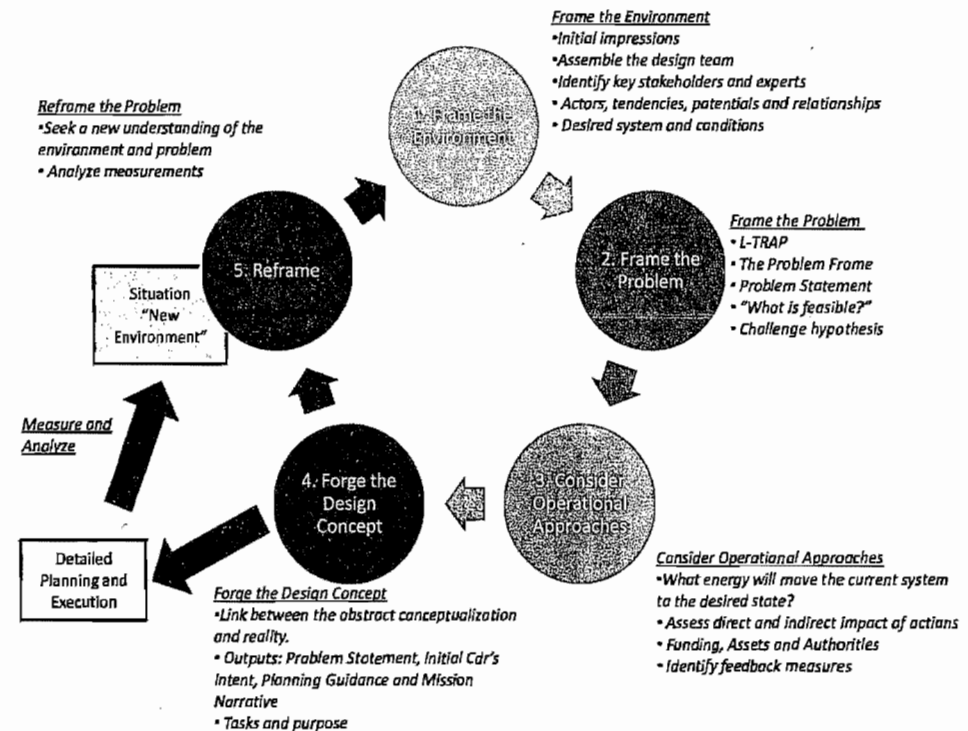


Figure 4: A sample causal loop diagram depicting the inter-active complexity of a hypothetical insurgency. (Taken from training workshop at U.S.M.C University and attributed to P.V. Ripper)

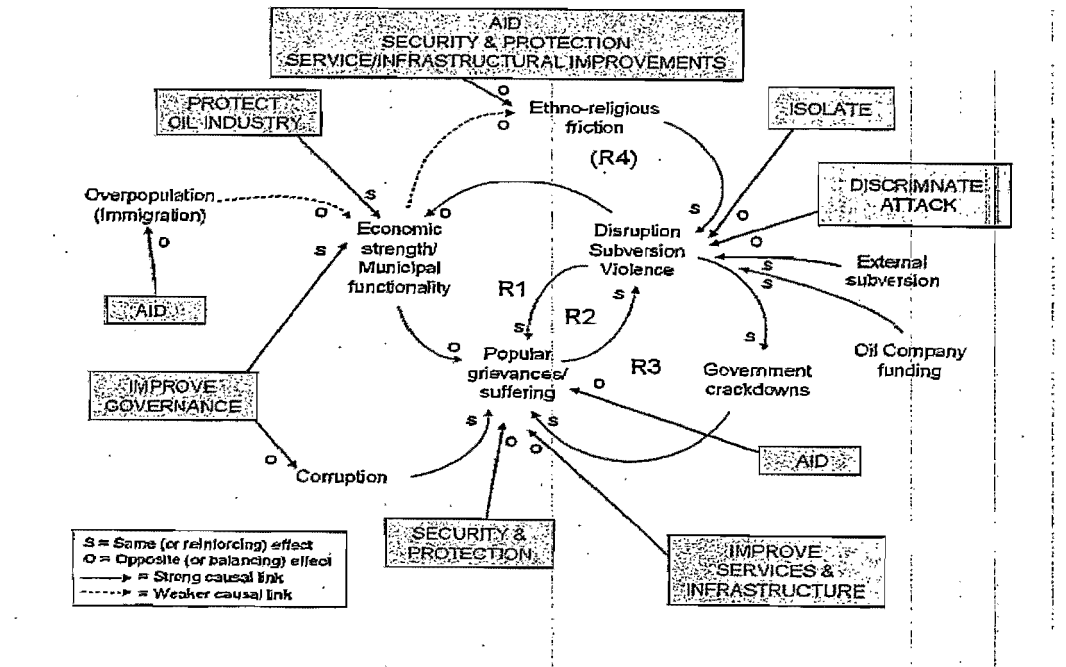
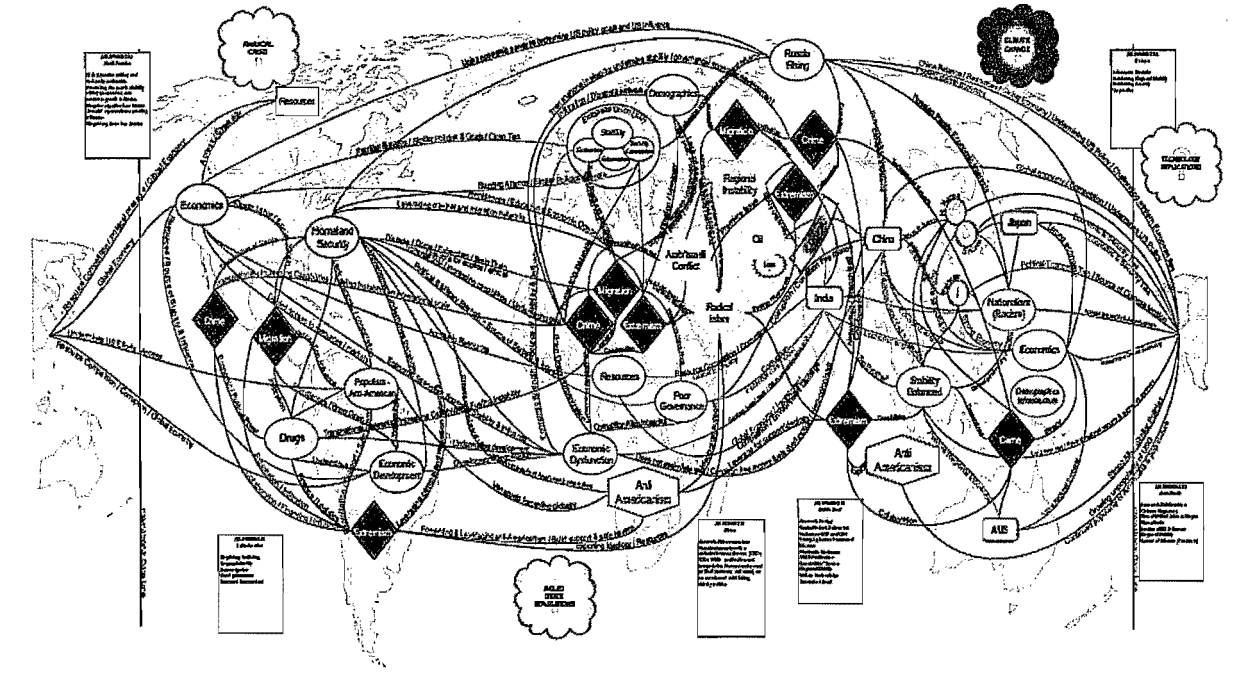


Figure 5: The 21st Century World as a “Strategic Ecology” (U.S. National Strategy Concept, 18 October 2010)



Endnotes:

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- ¹ U.S. Department of Defense, *The National Military Strategy of the United States of America*, 2011, p. 16
- ² Paul K. Van Riper, *An Introduction to System Theory and Decision Making*, 2010, p. 1, Interactively complex (nonlinear) systems are inherently unpredictable due to the freedom of action of its subcomponents.
- ³ U.S. Joint Forces Command, *Irregular Warfare: Countering Irregular Threats*, Version 2.0, 17 May 2010, p. 4
- ⁴ Ibid, p. 5
- ⁵ Ibid, p. 11
- ⁶ Van Riper, p.1 Structurally complex systems produce “rigid, lockstep and generally predictable behavior.” A structurally complex system becomes more complex as the number of parts increases and the more orderly the arrangement of those parts become in relation to each other.
- ⁷ U.S. Joint Forces Command, *Design in Military Operations*, 2010, p. 29
- ⁸ U.S. Army, School of Advanced Military Studies, *Art of Design*, Version 2, 2010, p. 1
- ⁹ Carl Von Clausewitz, *On War*, (New Jersey: Princeton University Press, 1984), p. 86
- ¹⁰ Van Riper, p. 1
- ¹¹ Ibid, p. 1
- ¹² Ibid, p. 1
- ¹³ Ibid, p. 5
- ¹⁴ Ibid, p. 1
- ¹⁵ *Art of Design*, p. 13
- ¹⁶ Sun Tzu, *The Art of War*, (New York: Oxford University Press, 1963) p. 88
- ¹⁷ U.S. Navy Tactical Training Publication 3-05.2, *SEAL Land Warfare*, Dec 2008, p. 2-4
- ¹⁸ M.H. Bazerman, *Judgment in Managerial Decision Making*, p. 4
- ¹⁹ U.S. Navy Tactical Training Publication 3-05.2, Chapter 2
- ²⁰ Ibid, p. 2-9
- ²¹ *The Art of Design*, pp. 11
- ²² Ibid, Location pp. 12
- ²³ Ibid, Location pp. 12
- ²⁴ Ibid, Location pp. 12
- ²⁵ Marston, D and Carter Malkasian, *Counterinsurgency in Modern Warfare*, (New York: Osprey Publishing, 2008), p. 237
- ²⁶ Ibid, p. 237
- ²⁷ Ibid, p. 237
- ²⁸ *Design in Military Operations*, p. 8
- ²⁹ *The Art of Design*, p. 14
- ³⁰ Operational design (DOD) is a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them.
- ³¹ John F. Schmitt, *A Systemic Concept for Operational Design*, Marine Corps Combat Development Command, Concepts and Plans Division, Marine Corps Warfighting Lab Concept Paper, Aug. 2006, p. 19
- ³² Interactively complex problems are sometimes referred to as “wicked” or “ill-structured.” For a more comprehensive definition of “wicked problems” see *A Systemic Concept for Operational Design*.
- ³³ *Art of Design*, p. 326
- ³⁴ U.S. Army Training and Doctrine Command, Field Manual 5-0, *Operations Process*, (Fort Monroe, Virginia, March 2010), Chapter 3, p. 3-12
- ³⁵ Clausewitz, p. 112
- ³⁶ *Art of Design*, p. 25
- ³⁷ *Design in Military Operations*, p. 8
- ³⁸ Ibid, p. 9
- ³⁹ Ibid, p. 8
- ⁴⁰ Ibid, p. 8
- ⁴¹ Ibid, p. 8
- ⁴² Ibid, p. 8
- ⁴³ J.F. Schmitt, p. 24
- ⁴⁴ Ibid, p. 9

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- ⁴⁵ “Satisfices” is a Systems Theory term that co-joins the words satisfy and sufficient
- ⁴⁶ K. Popper, *The Logic of Scientific Discovery*, (London, Routledge, 2002), p. xix
- ⁴⁷ *Operations Process*, p. 3-10
- ⁴⁸ *Ibid*, p. 3-10
- ⁴⁹ *Design in Military Operations*, p. 12
- ⁵⁰ *Ibid*, p. 3-11
- ⁵¹ Robert Jervis, *System Effects: Complexity in Political and Social Life*, (New Jersey: Princeton University Press, 1997), p. 10
- ⁵² The National Military Strategy of the United States of America, 2011, p. 5
- ⁵³ *Design in Military Operations*, p. 15
- ⁵⁴ *Ibid*, p. 14
- ⁵⁵ *Ibid*, p.15
- ⁵⁶ Clausewitz, p. 579
- ⁵⁷ *Design in Military Operations*, p. 16
- ⁵⁸ Sun Tzu, p. 101
- ⁵⁹ *Art of Design*, p. 141
- ⁶⁰ Alexander Bird, “Thomas Kuhn,” *The Stanford Encyclopedia of Philosophy*, (Fall 2008 Edition), p. 2
- ⁶¹ *Art of Design*, p. 131
- ⁶² *Ibid*, p. 142
- ⁶³ *Design in Military Operations*, p.26
- ⁶⁴ Department of the Army, U.S. Army Field Manual 3-24-2, *Counterinsurgency Doctrine*, (Apr 2009), p. 96
- ⁶⁵ Measure of Performance (DOD): An MOP is criterion used to assess friendly actions that is tied to measuring task accomplishment (JP 1-02). MOPs confirm or deny that the task has been correctly performed. An example of a MOP is “How many people registered to vote at the school this week?”
- Measure of Effectiveness (DOD): An MOE is criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect (JP 3-0). An example of a MOE is “Did the well project provide clean drinking water to the village?”
- ⁶⁶ *Art of Design*, p. 157
- ⁶⁷ *Ibid*, p. 40
- ⁶⁸ *Ibid*, p. 50
- ⁶⁹ *Ibid*, p. 51
- ⁷⁰ *Ibid*, p. 54
- ⁷¹ *Ibid*, p. 54
- ⁷² *Ibid*, p. 54
- ⁷³ *Ibid*, p. 54
- ⁷⁴ *Ibid*, p. 54
- ⁷⁵ Owen Connelly, *On War and Leadership: The Words of Combat Commanders from Frederick the Great to Norman Schwarzkopf*, (New Jersey: Princeton University Press, 2005) p. 125
- ⁷⁶ *Design in Military Operations*, p. 15
- ⁷⁷ *Art of design*, p. 22
- ⁷⁸ *Ibid*, p. 22